In the Claims

1. (Currently Amended) A free-space optical communication system comprising:

a transmitter configured to encode and transmit information over free-space, the information being encoded in a first optical carrier signal at a first carrier wavelength, and the inverse of the information being encoded in a second optical carrier signal at a second carrier wavelength; and

a receiver configured to receive and decode the information from the first optical carrier signals and the inverse of the information from the second optical carrier signal, wherein the receiver decodes the information from the first optical carrier and the inverse of the information from the second optical carrier by combining the signals thereby eliminating effects of detrimental background noise.

2. (Previously Presented) The system of claim 1 wherein said transmitter is configured to encode digital information in the first optical carrier signals and encode the inverse of the digital information in the second optical carrier signal.

3. (Previously Presented) The system of claim 2 wherein the first optical carrier signal includes information corresponding to logical 1's; and

the second optical carrier signal includes information corresponding to logical 0's.

4. (Previously Presented) The system of claim 2 wherein said transmitter is configured to communicate a logical 1 by transmitting a positive amplitude optical pulse at a first carrier wavelength and configured to communicate a logical 0 by transmitting a positive amplitude optical pulse at a second carrier wavelength.

5. (Previously Presented) The system of claim 1 wherein said transmitter is configured to transmit a first optical beam comprising the first optical carrier signal and a second beam comprising the second optical carrier signal .

6. (Previously Presented) The system of claim 5 wherein said receiver is configured to receive the first optical beam comprising the first optical carrier signal and the second beam comprising the second optical carrier signal.

7. (Previously Presented) The system of claim 1 wherein said transmitter comprises at least one multiplexer to multiplex the first and the second optical carrier signals.

8. (Previously Presented) The system of claim 1 wherein said receiver comprises at least one demultiplexer to demultiplex the first and the second optical carrier signals.

9. (Previously Presented) The system of claim 1 wherein the first and second optical carrier signals each comprises a carrier wavelength in the range of about 300 to about 10,000 nanometers.

10. (Previously Presented) The system of claim 1 wherein the first and second optical carrier signals each comprises a carrier wavelength in the range of about 300 to about 1,500 nanometers.

11. (Previously Presented) The system of claim 1 wherein the first and second optical carrier signals each comprises a carrier wavelength in the range of about 1,500 to about 10,000 nanometers.

12. (Previously Presented) The system of claim 1 wherein the first optical carrier signal comprises a first carrier wavelength and the second optical carrier signal comprises a second carrier wavelength, the difference between the first carrier wavelength and the second carrier wavelength being less than about 100 nanometers.

13. (Previously Presented) The system of claim 1 wherein the first optical carrier signal comprises a first carrier wavelength and the second optical carrier signal comprises a second carrier wavelength, the difference between the first carrier wavelength and the second carrier wavelength being greater than about 1000 nanometers.

14. (Previously Presented) The system of claim 12 wherein said transmitter is configured to change ~~a~~ the first and the second carrier wavelengths.

15. (Previously Presented) The system of claim ~~14~~ 10 wherein said transmitter is configured to change the first and the second carrier wavelengths from being within a range from about 300 to about 1,500 nanometers to being within a range from about 1,500 to about 10,000 nanometers.

16. (Previously Presented) The system of claim 11 wherein said transmitter is configured to change the first and the second carrier wavelengths from being within a range from about 1,500 to about 10,000 nanometers to being within a range from about 300 to about 1,500 nanometers.

17. (Previously Presented) The system of claim 14 wherein said transmitter is configured to change the first and the second carrier wavelengths in a random manner.

18. (Previously Presented) The system of claim 14 wherein said transmitter is configured to change the first and the second carrier wavelengths in a programmed manner.

19. (Previously Presented) The system of claim 14 wherein said transmitter is configured to embed control bits into at least one of the first and the second optical carrier signals for communicating future changes in carrier wavelengths to said receiver.

20. (Previously Presented) The system of claim 14 wherein said receiver is configured to decode said control bits and to receive the changed optical carrier signals including the changed carrier wavelengths.

21. (Original) The system of claim 1 wherein said transmitter comprises a member of the group consisting of a tunable laser, a tunable Fabry-Perot filter, a tunable Mach-Zehnder filter, an active Bragg grating wave guide, and an acousto-optical filter.

22. (Original) The system of claim 1 wherein said receiver comprises a member of the group consisting of an interference filter, a dense wavelength division multiplexing interference filter, a wide-angle geometry (WAG) detector, a wavelength dispersive element, a Fabry-Perot filter, and a switchable diffraction grating.

23. (Original) The system of claim 1 wherein said transmitter is configured to transmit data using multiple data channels, each of said data channels having first and second ones of said discrete optical carrier signals.

24. (Original) The system of claim 23 wherein each of said multiple data channels includes a bandwidth greater than about 200 gigahertz.

25. (Original) The system of claim 24 including at least 32 data channels and having a system bandwidth of greater than about 6.4 terahertz.

26. (Original) The system of claim 23 wherein said transmitter is configured to multiplex said multiple channels into a single beam.

27. (Original) The system of claim 23 wherein said transmitter is configured to multiplex said first ones of said carrier signals for each of said data channels into a first beam and said second ones of said carrier signals for each of said data channels into a second beam.

28. (Previously Presented) A wavelength modulated optical communication based fiberless optical communication system comprising:

a plurality of transmitters, each of the plurality of transmitters being configured to encode information into a first optical carrier signals and encode the inverse of the information into a second optical carrier signal;

a plurality of receivers, each of the plurality of receivers being configured to receive and decode the information from the first optical carrier signals and the inverse of the information from the second optical carrier signal;

a plurality of user ports, each of the plurality of user ports comprising at least one of the plurality of receivers;

a plurality of hubs, each of the plurality of hubs being configured for transmitting and receiving data with at least two of the plurality of user ports~~.~~; and

a plurality of repeaters each configured to receive, amplify, and route the first and the second optical carrier signals to at least one member of the group consisting of other repeaters, hubs, and user ports.

29. (Currently Amended) A method for free space communication of information comprising:

encoding the information into a first optical carrier signal at a first wavelength and the inverse of the information into a second optical carrier signal at a second wavelength;

transmitting the first and the second encoded optical carrier signals;

receiving the first and the second encoded optical carrier signals; and

decoding the information from the first optical carrier signal and the inverse of the information from the second optical carrier signal,

wherein decoding of the information from the first optical carrier and the inverse of the information from the second optical carrier is accomplished by combining the signals thereby eliminating effects of detrimental background noise..

30. (Original) The method of claim 29 wherein said encoding comprises encoding digital information.

31. (Original) The method of claim 30 wherein said encoding digital information comprises encoding a high amplitude optical pulse at a first carrier wavelength to correspond to a logical 1, and encoding a high amplitude optical pulse at a second carrier wavelength to correspond to a logical 0.

32. (Previously Presented) The method of claim 29 further comprising:

the first and the second optical carrier signals into a single beam; and demultiplexing the single beam into the first and the second optical carrier signals.

33. (Previously Presented) The method of claim 29 further comprising:

multiplexing a plurality of data channels into a single beam, each of said data channels having first and second ones of said optical carrier signals; and

demultiplexing said single beam into said first and second ones of said ~~discrete~~ optical carrier signals.

34. (Previously Presented) The method of claim 29 further comprising:

multiplexing a plurality of data channels into first and second beams, each of said data channels having first and second ones of said optical carrier signals, said first beam including said first optical carrier signals of each of said data channels, and said second beam including said second optical carrier signals of each of said multiple data channels; and

demultiplexing said first and second beams into said first and second optical carrier signals of said data channels.

35. (Original) The method of claim 32 wherein said multiplexing and said demultiplexing comprise dense wavelength division multiplexing.

36. (Previously Presented) The method of claim 29 wherein the first and the second optical carrier signals each comprises a carrier wavelength in the range of about 300 to about 10,000 nanometers.

37. (Previously Presented) The method of claim 29 further comprising changing the carrier wavelength of the first and the second_optical carrier signals to different wavelengths.

38. (Original) The method of claim 37 wherein a first pair of carrier wavelengths, λi and λj, are changed to a second pair of carrier wavelengths, λk and λl, wherein $(\lambda k-\lambda i)/(\lambda k+\lambda i)<0.5$.

39. (Original) The method of claim 37 wherein a first pair of carrier wavelengths, λi and λj, are changed to a second pair of carrier wavelengths, λk and λl, wherein $(\lambda k-\lambda i)/(\lambda k+\lambda i)>1$.

40. (Original) The method of claim 37 wherein said changing comprises changing in a random manner.

41. (Original) The method of claim 37 wherein said changing comprises changing in a programmed manner.

42. (Original) The method of claim 37 wherein said encoding comprises embedding control bits in the information for communicating future changes in the carrier wavelengths to a receiver.